How the IoT is Enabling Safer Material Handling Operations

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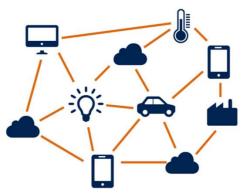
The IoT or "Internet of Things"



The **Internet of things** is the internetworking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data



The interconnection via the Internet of computing devices embedded in everyday objects, enabling them to send and receive data







Lift Truck Safety Statistics

- 100,000 forklift accidents every year
- 11 percent of all forklifts are involved in accidents each year
- 100 the approximate number of fatalities from forklift accidents every year, in the U.S. alone

(Source: U.S. Department of Labor)





"If it can't be measured, it can't be managed"

- Vehicle Management Systems (VMS) are IoT technology enabled systems that provide:
 - Networked connection and communication with lift trucks, allowing collection and analysis of operational vehicle / fleet data
- With VMS, enterprises can:
 - Accurately measure lift truck safety compliance
 - Control user access to lift trucks
 - Take appropriate action to correct safety issues
 - Identify unsafe drivers
 - Reduce safety incidents





Primary Safety Benefits of VMS

- Prevent unauthorized access to vehicles
- Ensure only trained drivers operate trucks
- Monitor and reduce impacts
- Reduce anonymous damage
- Enforce pre-shift safety checklists
- Lock-out equipment with safety issues
- Reduce speeding and unsafe driving behaviors





Vehicle Access Control

- Restrict access to ensure only trained, authorized users can operate vehicles
- Lock-outs, group authorization, shift / scheduling control
- Driver training certification reporting

Electronic Safety Checklists

- Enforce compliance and eliminate paper checklists
- Ensure trucks are safe to drive
- Automatic notifications to maintenance personnel of unsafe vehicles





Impact Management

- Identify unsafe drivers
 - No more anonymous damage to facility and product!
- Auto-learning sensor monitors impacts
 - Automatic truck shutdown for severe impacts
 - Visual and audible alerts as impacts occur
 - Require safety checklist completion after impacts
 - Email / Text Message Notifications to Managers and Maintenance Personnel





Safety and Analytics

Analytics reporting allows managers to see and stay on top of safety violations, unsafe driving, and unsafe vehicles

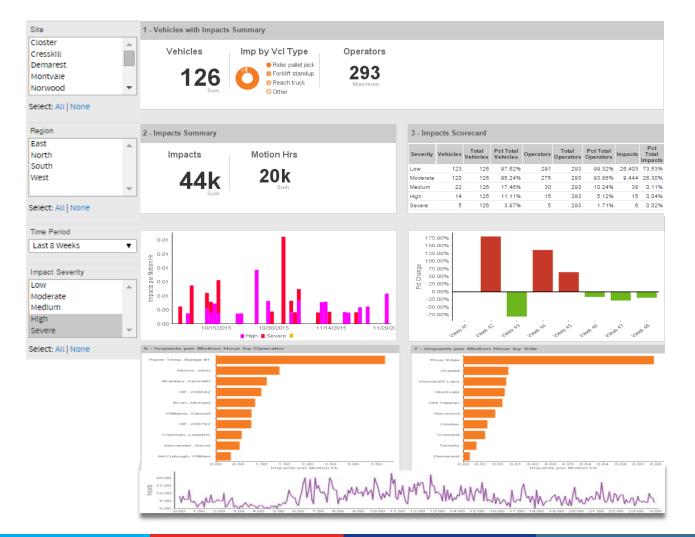
- See which drivers are most hazardous to your operation
- Identify critical safety and vehicle issues
- Monitor compliance with safety standards
- Compare performance across sites and the enterprise





Impacts Dashboard

Analyze Impacts by Site, Severity, Operator, Vehicle



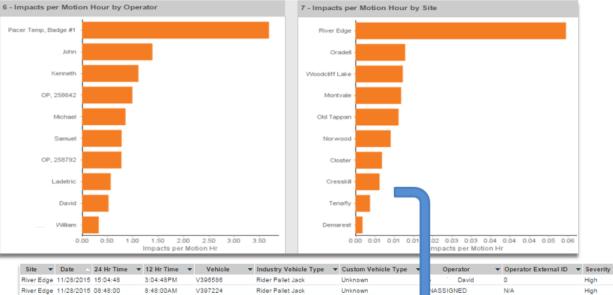




- Impact Patie

Impacts Dashboard

Drill thru by Operator or Site to analyze Impacts details



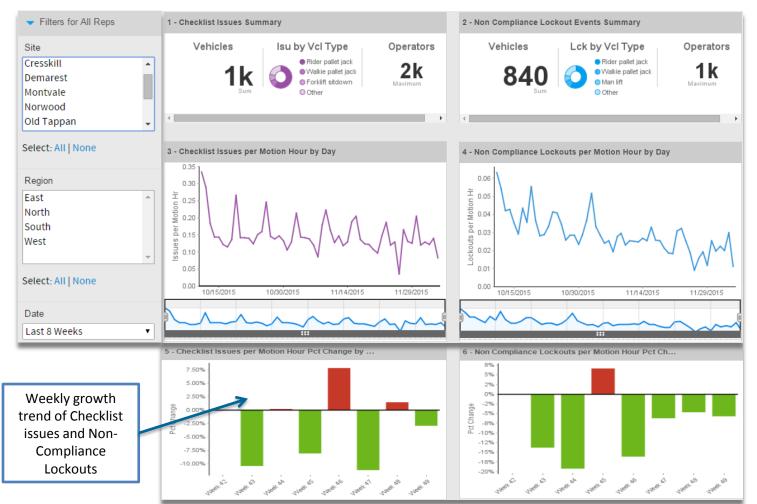
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River Edge	11/28/2015	07:39:24	7:	39:24AM	V397224	Rider Pallet Jack	Unknown	2	kokson, Billy	0		High		6.2800
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River Edge	11/25/2015	10:05:14	10	0:05:14AM	V396647	Rider Pallet Jack	Unknown		Tyler	0		Severe		8.1700
River Edge	11/25/2015	08:35:28	8:	35:28AM	V396636	Rider Pallet Jack	Unknown		Jose	0		Severe		8.2200
River Edge	11/25/2015	00:43:04	12	2:43:04AM	V396633	Rider Pallet Jack	Unknown		Antwan	0		High		5.4100
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River Edge	11/22/2015	07:04:36	7:	04:38AM	V397224	Rider Pallet Jack	Unknown	L	JNASSIGNED	N/A		High		7.3400
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River Edge	11/21/2015	10:03:32	10	D:03:32AM	V396655	Rider Pallet Jack	Unknown	0	DP, 258755	0		High		7.9200





Compliance Dashboard

Analyze Non-Compliance Events by Site







Compliance Dashboard

Drill to detail by Site or Operator

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In Conclusion

- Vehicle Management Systems are a global best practice for improving lift truck safety
- VMS technology has been adopted by over half of Fortune 200 companies with lift truck operations
- Critical risk management tool for global enterprises concerned with employee safety and financial risk of hazardous operating conditions





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